FRD01 – On Farm Research and Demonstration 4 Strategic Use of Raw or Composted Feedlot Manure as a Soil Amendment

State Criteria for on Farm Research and Demonstration

Research Topic: Strategic use of raw or composted feedlot manure as a soil amendment.

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Name and brief description of the research entity: The University of Nebraska-Lincoln Extension.

General description and summary of research to be conducted: Justification: much of the value of applying feedlot manure to crop land, in addition to nutrient supply, is the increased yields resulting from soil amendment. The amendment effect may be due to some combination of:

- effect on soil aggregation and improved water infiltration with runoff and erosion reduced by about 2% for each ton/acre dry matter manure applied;
- increased soil organic matter; and
- neutralization of soil acidity, at least with beef cattle manure, with a ton of manure, dry weight, having the liming effect of about 60 lb of agricultural lime.

The amendment effect on yield is much greater on some land, generally less productive land, than other lands. The additional effect on yield can be important to manure use when transport and other costs of using the manure are high.

Objective: To determine the soil amendment effect of manure on yield for land of differing levels of productivity and to develop criteria for identifying land that will give the best returns to manure application.

Procedure: Trials will be conducted in fields where different manure rates can be applied in strips of at least 1000 ft transecting different levels of productivity as indicated by yield maps. The treatments will be one-time applications of raw or composted feedlot manure at rates of 0, 7, 14, and 21 t/ac. Trials will have four replications and a total of 16 strips. Manure will be analyzed for nutrient (ammonium-N, organic N, P, and K) and water content. Fertilizer application will be applied uniformly across the trial area according to the producer' choice but the information will be shared with the cooperating Extension Educator. The experiment requires yield mapping; and a guidance system is preferred.

Observations will include a yield map for three years after application. In year three, soil samples will be collected from areas of greater and lesser response and yield to relate soil properties to productivity and response to manure application.

Area of Focus: Soil quality.

Geographic Area: Annual crop producers in corn-soybean based systems in the counties of Lancaster, Gage, Jefferson, Hamilton, Saunders, Stanton, Hall, Adams and Dodge counties.

Participant requirements:

- A detailed plan must be developed in conjunction with the researcher that provides project details, plot locations, on aerial photos and in written format and **be provided to NRCS prior to scheduling the project.**
- All inputs for the research project, including crop seed, fertilizer, herbicides, farm equipment, and manpower will be provided by the participant. Participating producers will be responsible for contacting an Extension Educator for technical assistance at critical times (layout of trial, applying treatments, harvest), all field operations including those for establishing the trial and collecting the yield data; in some cases the technical assistance may be delegated by the Extension Educator to a crop consultant or another agronomic advisor.
- Grain yield for each strip will be collected using a weigh wagon, yield map or monitoring equipment, or other means in agreement with the cooperating Extension Educator. Grain moisture will be determined for each strip. All data will be provided to the cooperating Extension Educator. All costs of implementation, excluding Extension advisory visits, will be the responsibility of the producer. Hybrids/varieties and other management practices will be the producer's choice.
- Minimum of 12 acres will be needed for the replications. Growers must have their own harvest equipment, preferably equipped with a yield monitor. Growers with their own sprayers and fertilizer applicators are preferred, but commercial herbicide and fertilizer applications are acceptable.
- The research will last a minimum of three years.

Number and size of on-farm research sites needed: At least 3 growers from the geographic area. Each site must be at least 12 acres.

Documentation: Complete the following Table and provide the documentation listed below:

Tract	Field(s)	Acres Planned				Acres Applied (completed by operator)
EX. 1	*1*	*20*				*20 acres*

I certify that the following information meets specifications and has been provided to NRCS:

1. Complete the table above and provide a map with delineation of the area where the enhancement was applied including partial fields.
2. Photographs of a representative number of fields/plots showing demonstration or research.
3. Final report based on University of Nebraska Extension Service that documents that details findings of the research project including soil moisture, inputs, yields, plot records, replicated treatments and all other pertinent information on each plot.

Certified by: _____ **Date:**_____